

Application Serial No. 10/039,411
Amendment Dated August 21, 2003
Reply to Office Action dated May 21, 2003

Remarks

Applicant confirms the election of claims 1-9 for examination. Claims 2-5 and 10-24 have been canceled; and claims 1 and 6-9 have been amended. Claims 1, 6-9 remain in the application, and re-examination and reconsideration of the application are respectfully requested.

Claims 1 and 6 are rejected under 35 U.S.C. §102(a) or (e) as being anticipated by Leary et al. (U.S. Patent No. 6,299,931). Claims 2-5 have been canceled. Leary et al. relates to a system for setting up, regulating and monitoring an applicator applying strips of glue to blanks moving on a conveyor. Referring to Fig. 1A, an applicator 115 has a reference sensor 125, a dispenser 130 and an applied location sensor 135 mounted above a moving conveyor 100 having a blank 105. A controller 122 is responsive to feedback signals from the sensors 125, 135 and a conveyor encoder 140 for controlling the operation of the dispenser 130, such that a strip of glue is consistently applied to blanks 105 being moved by the conveyor 100.

Leary et al. requires a relatively time consuming setup procedure as described with respect to Figs. 4 and 5 at Col. 4, line 7 to Col. 5, line 28. With the setup procedure, an example blank has marks simulating the desired pattern of material depositions. The example blank is moved along the conveyor, and the marks are detected by the various sensors. By this process, the desired pattern of material depositions is taught to the controller 122. The setup process is conceptually similar to the prior art setup procedure discussed at page 3, line 16 to page 4, line 5 of the application.

After the setup procedure has been completed, the system operation can begin, as discussed with respect to Figs. 7 and 8, in which a target blank is moved along the conveyor; and material is deposited thereon. As illustrated in Fig. 7, the controller 122 is able to sense the applied location of glue on a first target blank; and as indicated at 520 of Fig. 7, the applied location is compared with a desired location as taught during the setup process. Based on that comparison, the controller adjusts an offset time so

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that, on a subsequent target blank, the applied location of the glue more closely corresponds with its desired location. Thus, the controller 122 continuously adjusts the applied location of the glue with each target blank.

In contrast, the apparatus of claim 1 and 6 recites a monitoring apparatus having a trigger sensor 41 providing a transition signal representing a detected characteristic, for example, a forward edge, of the substrate moving with respect to the dispensing gun. Next, an input signal processor 62 samples a reference signal representing a change in operating state of the dispensing gun and a feedback signal representing a detected edge of fluid on the substrate resulting from the reference signal. The input signal processor provides a first representation of an edge of a transition signal and a second representation of an edge of a feedback signal that corresponds to an edge of fluid dispensed on the substrate resulting from the edge of a respective reference signal. The first and second representations created are stored. A signal correlator means 64 correlates the second representation to the first representation, and an output processor 66 extracts a delay between the edge of the reference signal and the corresponding edge of the fluid dispensed on the substrate resulting from the edge of the reference signal that occurred between successive transition signals. The output processor can also be used to present outputs to the user representing the extracted delays, for example, an output may detect a drift in the dispensing process that requires operator attention.

While there are some similarities in the fluid dispensing applications of Leary et al. and the claimed invention, Applicant submits that the structure of Applicant's claimed invention differs from Leary et al. for the following reasons:

1. All of the claims require a signal correlator means for correlating a second representation of a feedback signal edge to a first representation of a reference signal edge. The correlation process is described at page 11, line 3

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to page 12, line 19 and is a correlation process that is in the realm of digital signal processing theory. This digital signal processing correlation provides robust signals from which a delay can be accurately and reliably extracted in an electrically noisy industrial environment. In contrast, Leary et al. does not use a digital signal processing correlation; but as indicated at 520 of Fig. 7, Leary et al. compares the applied location of the fluid to a desired location that must be taught to the controller 122. Thus, Leary et al. must use the setup process of Figs. 4 and 5, which is not required with the claimed invention.

2. All of the claims require that the stored second representation be correlated with the stored first representation. Thus, the detected edges are correlated to each other and are not compared to a previously taught stored program as required by Leary et al.

3. All of the claims require an output processor that extracts a delay from the correlated data, that is, data that was detected and stored in real time. The determination of the delay does not require the presence of taught or programmed data representing a desired pattern of material deposition as is described in Leary et al.

The signal correlator means of the claimed invention has the advantages of first, providing a more robust system in which a delay can be accurately and reliably extracted in an electrically noisy industrial environment. Second, a pattern of desired material depositions does not have to be programmed or taught to the input signal processor in order to determine the delays. Therefore, the setup required to use the claimed invention is substantially less than that required by Leary et al. Applicant submits that Leary et al. does not contain any description of an input signal processor, signal correlator means and output signal processor as recited in the claims; and therefore, Applicant submits that claims 1 and 6 are

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patentable and not anticipated under 35 U.S.C. §102(a) or (e) over Leary et al.

Claims 1-6 are rejected under 35 U.S.C. §103(a) as being unpatentable over Leary et al. (U.S. Patent No. 6,299,931) and Medler et al. (U.S. Patent No. 4,957,782). Medler et al. relates to a method of sequentially coating workpieces. More specifically, Medler et al. measures switching on and off delay times of a paint needle valve and compares those measured delay times to stored delay times. That comparison may be used to operate an alarm; and in other circumstances, the measured delay times may be used to compute a new stored delay time.

In order to establish a prima facie case of obviousness, it is necessary that the Office Action present evidence, preferably in the form of some teaching, suggestions, incentives or inference in the applied prior art or, in the form of generally available knowledge, that one having ordinary skill in the art would have been led to arrive at the claimed invention.

Applicant submits that a prima facie case of obviousness is not made because the combination of Leary et al. and Medler et al. does not teach, suggest or motivate one to provide the elements recited in independent claims 1 and 6. All of the claims require a signal correlator means for correlating a second representation of a feedback signal edge to a first representation of a reference signal edge. The correlation process is described at page 11, line 3 to page 12, line 19 and is a correlation process that is in the realm of digital signal processing theory. This digital signal processing correlation provides robust signals from which a delay can be accurately and reliably extracted in an electrically noisy industrial environment. In addition, a pattern of desired material depositions does not have to be programmed or taught to the input signal processor in order to determine the delays. Neither Leary et al. nor Medler et al. uses a digital signal processing correlation as required by the claims.

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Thus, Applicant submits that neither reference contains any description, suggestion or motivation to provide the "signal correlator means" required by the claims; and therefore, claims 1 and 6 are patentable and not obvious under 35 U.S.C. §103(a) over Leary et al. and Medler et al.

Claims 7-9 are rejected under 35 U.S.C. §103(a) as being unpatentable over Leary et al. (U.S. Patent No. 6,299,931), Medler et al. (U.S. Patent No. 4,957,782) and Popp et al. Popp et al. relates to an apparatus for controlling a spray of liquid in a pattern and does not disclose or suggest the signal correlator means of claims 7-9. Applicant submits that a prima facie case of obviousness is not made because the combination of Leary et al., Medler et al. and Popp et al. does not teach, suggest or motivate one to provide the elements recited in independent claims 7-9. As discussed above, all of the claims require a signal correlator means for correlating a second representation of a feedback signal edge to a first representation of a reference signal edge. This digital signal processing correlation provides robust signals from which a delay can be accurately and reliably extracted in an electrically noisy industrial environment. In addition, a pattern of desired material depositions does not have to be programmed or taught to the input signal processor in order to determine the delays. Neither Leary et al., Medler et al. nor Popp et al. uses a digital signal processing correlation as required by the claims. Thus, Applicant submits that claims 7-9 are patentable and not obvious under 35 U.S.C. §103(a) over Leary et al., Medler et al. and Popp et al.

Claims 1-9 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over various claims identified in the Office Action of copending Application Serial No. 09/880,649 in combination with the cited references. Applicant submits that claims 1 and 6-9 recite a signal correlator means that is not described or suggested in either the above-identified application nor the cited references;

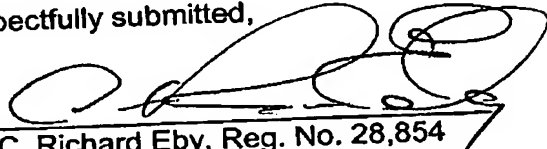
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and therefore, Applicant respectfully requests that this provisional rejection be withdrawn.

Applicant respectfully submits that the application is now in condition for allowance and reconsideration of the application is respectfully requested. The Examiner is invited to contact the undersigned in order to resolve any outstanding issues and expedite the allowance of this application.

Respectfully submitted,

By:


C. Richard Eby, Reg. No. 28,854

WOOD, HERRON & EVANS, L.L.P.
2700 Carew Tower
Cincinnati, Ohio 45202
PH: (513) 241-2324, Ext. 292
FX: (513) 241-6234